

EM433 Computer-Aided Manufacturing

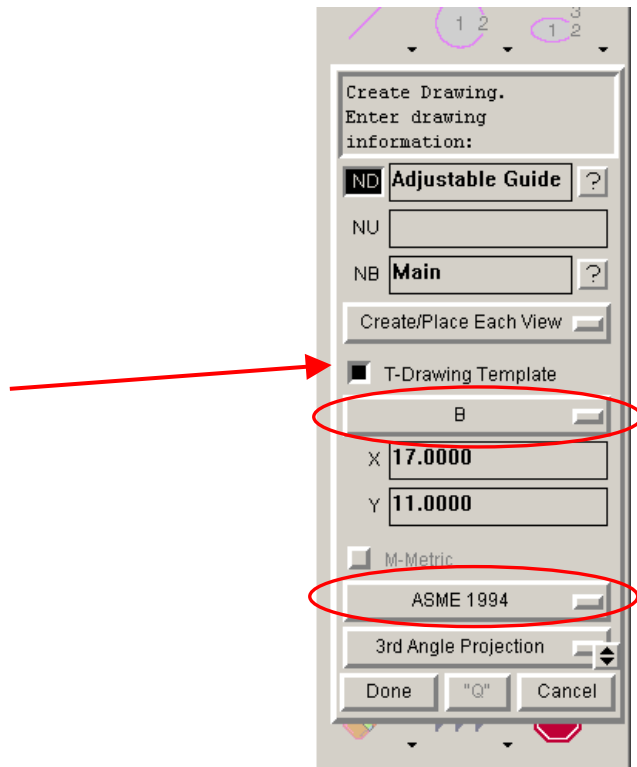
Laboratory Exercise 2 – Detail Drawings, Dimensions and Tolerancing

Objective: The objective of this lab exercise is to learn how to generate detail drawings with dimensions and tolerances.

Instructions:


1. Start I-DEAS in Master Modeler, open an new model file, call it Lab2_m01xxxx where m01xxxx is your alpha code
2. In the icon panel, select *Help...Help Library..., Tutorials*
3. When Internet Explorer starts, a list of available tutorials will be shown, under *Drafting*, select *Associative Drawings*. A new page will open. Follow the tutorial instructions to complete the first three lessons on this page:
 1. Create Associative Drawings
 2. View Creation Options
 3. Adding Section, Detail and Auxiliary Views
4. Close the model file from the tutorial and open the model file from Lab 1. Get the Adjustable Guide onto the workbench. Switch to the *Master Drafting* task if you are not already there.
5. Create a four view drawing of the Adjustable Guide. Select a B-size drawing and *ASME 1994* as the drawing standard when creating the drawing.


Make sure you check the *Drawing Template* box.




6. Make sure that each of your views is lined up with the adjacent views. If you need to adjust your view positions to line them up properly, follow this procedure.

Click the cursor inside the front view to make it active. It should have a dashed border.

Move the front view where you would like it by using the *Move View* icon .  (3rd col., 2nd row) Drag the view into the desired location. The adjacent views are probably not lined up so you need to get them into position.

Click in the top view to make it active. Select the *View Origin* icon  (In the stack, 3rd. col, 1st row). Drag the axes in the top view to line up the top view with the y-axis in the front view. A small circle line will appear on the origin in the front view when the axes are aligned. You may have to drag the view down over the front view to help I-DEAS find the axis. Once it sees it, you can continue to drag the view into position above the front view.

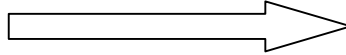
Repeat this procedure to align the right side view with the front view.

7. All dimensions must fit within the borders of a view. You probably have to resize the view borders to create space for the dimensions. Use the *View Borders* icon  (3rd. col., 1st row stack) icon to resize the border for each view so that you have room to add the dimensions.


Make a view active by clicking in it, select the icon and then click and drag the cursor to define the new borders. Repeat for each of the views. It is OK, even desirable, to have the borders overlap each other. This gives you more freedom to place the dimensions.

7. Modify the drawing appearance by selecting the *View Properties* icon

twice, pick *Except Main*, then pick  and set *Precise Hidden*, uncheck (if checked) *Key Driving Dims*, and *Annotation/Doc Dims*, then *Done* as shown here.




(If you pick an icon twice, you can easily apply the following action to all views simultaneously)

Click the *Update* icon  (center of bottom group) to reprocess the changes.


8. Add dimensions to the drawing following the recommended practices in the handout on Dimensioning and Tolerancing (see EM477 Course Notes).


- a. Add centerlines to all features needing them. Pick the


Centerlines icon (top group, middle column, 3rd row) .


Then select any arcs or circles that need centerlines defined.

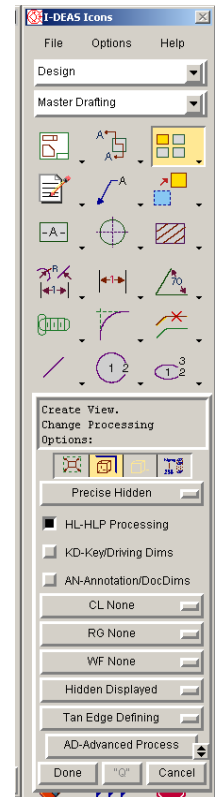
You may have to switch from *Front View* to *Side View* in the center panel to draw centerlines for circular features that are viewed from the side

- b. Use *Dynamic Dimensioning* (middle group, left column, 1st row)  to add dimensions to locate and size each feature.

- c. Use *Leader* (top group, middle column, 2nd row)  to add notes that require a leader.

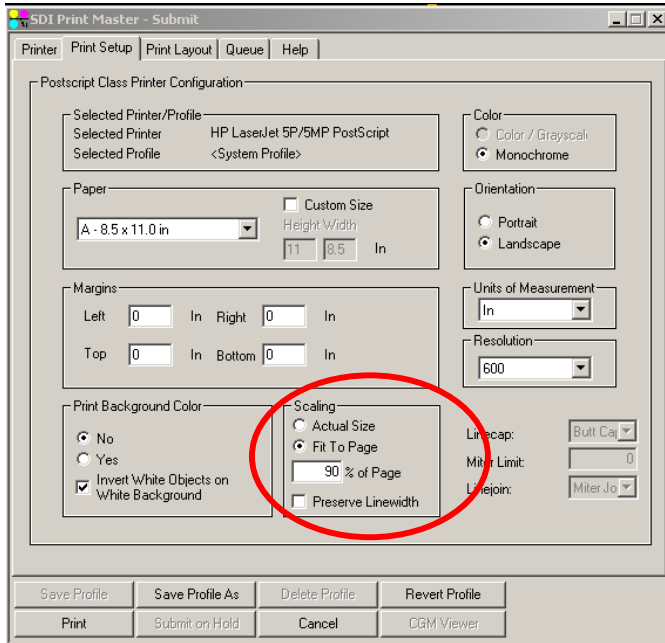
- d. Use *Notes* (top group, left column, 2nd row)  to add tolerances to the title block, a title and fill in other information such as Drawn by, Date, etc.

8. Pick the *View Visibility* icon **twice**  (in stack, 3rd col. 1st row), select *All Views*, and hide the view borders and view names, then *Done*. (You don't want these to appear on the printed copy of the drawing. They are useful when placing dimensions



to help you identify which view is the working view and show the limits of the area where you can place a dimension.)

9. Print out a copy of your completed drawing using the *File...Print* command to print from the file. On the Print Setup tab in the Scaling section, check the button *Fit to page* and set it to 90%



10. You may get a message, "Image exceeds the printable page size." You can ignore that.
11. Save your work. Switch to Master Modeler, put away the Adjustable Guide and get out the Bearing Guide.
12. Create a two view drawing of the Bearing Guide. The views should be a Top View (looking down on the three holes) and a full section view thru all three holes so that you can see the interior of the bore on the part and use object lines to dimension the interior details.
13. Dimension the drawing, add titles, etc. Print out a copy of the drawing.
14. Turn both completed drawings in _____.

R. Link
updated for I-DEAS 9
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